

63.8 5582

JANUARY 1953

SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION •

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

ROBERT M. SALTER
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

JANUARY 1953
VOL. XVIII—NO. 6

★ THIS MONTH ★

	Page
WILDLIFE HISTORY and THE SOIL By Durward L. Allen	123
HON. CHARLES J. WARNER OF NEBRASKA— A District Profile By A. E. McClymonds	127
REPORT ON SEVENTH ANNUAL SESSIONS OF SOCIETY By A. M. Hedge	129
YOUNG FARMERS' DAY By Phoebe O'N. Harrison	132
COLUMBIA BASIN RESPONDS TO IRRIGATION By Herb Boddy	136
HIGHWAY USERS, FARMERS, AND TAXPAYERS BENEFIT By A. E. McClymonds	140
FORESTRY AND ITS CAREER OPPORTUNITIES—A Review By C. B. Manifold	143

WELLINGTON BRINK
Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

15 CENTS PER COPY

FOREIGN—\$1.75 PER YEAR

\$1.25 PER YEAR

25 percent discount on orders of 100 or more subscriptions
mailed to a single address



GUIDE FOR YOUNG AND OLD.—If junior is a Boy Scout he should have a copy of the new Merit Badge Manual on Soil and Water Conservation. If he isn't a Scout he should have a copy anyway. The new manual affords an opportunity for nearly 3,000,000 Boy Scouts in America, whether they live in the city or in rural areas, to earn a merit badge in soil and water conservation.

The new booklet is a well-written, easy-to-read treatise on the conservation of soil, water, wildlife, and forestry. We would recommend too, that "Pop" take an evening, relax in his soft chair and review the booklet. He would learn a lot about soil and water conservation that

(Continued on page 131)



FRONT COVER.—Good living is a part of conservation farming. Wesley Harvey hangs about 1,500 buckets in his maple grove in Garrett County, Md., and in a normally good season harvests enough sugar water to make 500 gallons of syrup. Five-gallon gathering pails are used. The late A. F. Hallowell took this photograph.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Note.
Wash.

WILDLIFE HISTORY and THE SOIL

By DURWARD L. ALLEN



Breaking up the forest produced new vegetation types, a new habitat, and a new animal community that we now know as "farm wildlife."

A SATISFACTORY history of American wildlife never has been written. Properly done, it would have to be related closely to what happened to the land, water, and vegetation. Such a history would show that wildlife management works—that changes in a habitat are reflected, practically from year to year, by changes in the numbers and composition of animal populations.

It would deny some misinterpretations that were made because the interpreters lacked sufficient basic knowledge to sort out good observations from poor ones, and jumped to conclusions supported only by superficial logic.

However it may have come about, the idea is widespread that the primitive forest supported more wild game and other creatures than we have had since the coming of the white man. It is assumed also that wildlife abundance was almost universal over pre-Columbian North America. The story is told frequently that as the forests were cut, game birds and mammals were herded together in ever-narrowing coverts where predators and market hunters found them easy to wipe out.

Taking the latter idea first, the biologist knows that there is an annual turn-over of individuals in species of the small-game category which commonly runs 70 to 80 percent, or more. Even among deer the turn-over may be 40 percent. With each year's crop largely being produced anew from a relatively small breeding stock, the herding-together concept does not hold up.

What actually happened to habitats and populations probably can be described best in terms of three principles recognized by the population

biologist: (1) That wildlife abundance nearly always is the product of fertile soil or water; (2) that many kinds of animals belong to early plant successions; and (3) that most species are benefited by a mixture of vegetation types.

All three principles are illustrated by the past and present status of the bobwhite quail in the northern Lake States. The quail is a "songbird" in Michigan; it has not been hunted for many years. But it does not build up to high densities in spite of the fact that there are plenty of areas with sufficient cover and a reasonably good food supply.

The curious fact is that Michigan quail hunting once was famous. Hard winters might kill the birds back to a remnant, but in a few favorable years they would build up to bountiful numbers again. Why the abundance of "the good old days" is not now duplicated, at least occasionally, has been something of a mystery.

The explanation very likely goes back to the soil, and it can be applied to many similar comparisons involving other species and other areas. Michigan's bumper quail crops seem to have been produced on the best lands of the State at a time when these areas were half-cleared and soils were in the virgin condition. Forest cutting had broken up the woodland and set blocks of vegetation back to early brush and weed stages. These areas were interspersed

Note.—The author is biologist, U. S. Fish and Wildlife Service, Washington, D. C.

with crop fields that yielded abundant food in the form of weed seeds and waste grain. Quail and grouse thrived and filled many a mixed bag in the vicinity of Saginaw and other areas of fertile land in lower Michigan (6).

These same lands now support the State's most intensive agriculture. The fertility and wildlife-producing potential still are there, but the cover pattern, and the birds, are gone. Quail and grouse are creatures of brushy edges, where they have access to several cover types. They differ in that the grouse depends mostly on woodland and the bobwhite is to a greater extent a bird of open fields. Both belong to early stages in a plant-succession series, the end product of which is forest. Put optimum quail cover on a fertile soil and you get maximum populations. Put such conditions on a soil of medium productivity and you have numbers such as are found in many diversified farming areas from Illinois to Maryland. Put them on a poor soil and you have the sparse populations of northern marginal lands and southern piney woods. There are reasons for thinking that, to support a given density of birds, a better soil is needed in the North than in the South. Climate, of course, would make the difference.

In the days of pioneer agriculture there were a few good observers who recognized the significance of what they saw. William B. Mershon said that his early hunting for grouse was too much in the thick woods and that later he learned to hunt the edges (6). In 1848, Frank Forester said of the woodcock and quail: "Neither . . . are ever found in the depths of the untamed forest, aloof from human habitations; although both genera frequent, may require, woodland . . . for their habitation. Moreover, in places where they are entirely unknown to the first settlers, where they do not in fact exist at all, they speedily become abundant, so soon as the ax levels the umbrageous forest, and the admitted sunbeams awaken or mature the germs of that animal or vegetable life, on which the birds subsist." (1)

This sort of history was not restricted to forest lands. It can be seen also in what happened to the prairie chicken or pinnated grouse. The virgin prairies were covered by a grass "climax" in contrast to conditions in more humid lands of the East where forest was the last stage in plant succession. Chickens do not seem to have been



A planned program for wildlife now will include living fences, hedges and similar measures that have agricultural value and help break up the cover pattern on the farm. (Courtesy Illinois Natural History Survey.)

abundant in much of their original grassland home. But when homesteading brought a scattering of grainfields to the prairies, the broken-up pattern produced a spreading-out and a boom in prairie grouse. Missouri chickens and Michigan quail were enjoying their heyday also.

At one stage, the most fertile prairies of Missouri undoubtedly supported the greatest abundance of prairie chickens. Today such lands support none at all. Long since, the prairie sod was turned into the deep loam and now the land is working hard in a grain agriculture. The change is complete from pure grassland to a crop-field type. Farm lands of medium fertility are partly in grass, and there is where the greatest numbers of pinnated grouse are found today. There is even more grass in the poorest prairie land, but chickens are few, obviously limited by the native fertility of such areas (2). The total number of these birds is small and the outlook for the species is not bright.

Fertility relationships of various animals are widely evident. Productive soils yield both more and better animals. Just how it comes about is not completely known, but there can be no doubt of it. This situation has been most intensively studied in Missouri. There January weights on more than 175,000 rabbits were correlated with soil regions from which the animals came. It was found that rabbits from better soils of the State were a third heavier than those from soils classed as "poor." Leg bones of the more thrifty rabbits were up to 12 percent larger and had a breaking strength 37 percent higher. Similar relationships were found in raccoons and muskrats (3).

Striking correlation was found in Missouri turkeys. A single soil type, Clarksville stony loam, supports approximately 79 percent of the wild turkeys of the State. It is a limestone-derived soil of the Ozark Plateau. In eastern Ozarks, the land looks much the same, but the soil is derived from granite, and turkeys are few. Inherent fertility seems to be the greatest difference between the two areas (5).

Early explorers of North America had good reason to be impressed with the high productivity of some regions and the wildlife scarcity of others. The buffalo millions of the central grasslands were the greatest big-game resource of historic times. They were nurtured by the mineral-laden forage that grew on the most fertile soils of this continent.

In contrast, there were "badlands" and barrens in the West where game was nearly absent

and the traveler frequently had to kill his horses in order to live. Likewise, north of the eastern Great Lakes, winter starvation was almost the *status quo* for various Algonquin tribes who hunted a region of shallow soils and igneous rock that supported little game. Southward, in New York and Southern Ontario the Iroquois and Hurons lived by a maize agriculture (8). There, better soils and a milder climate produced good game populations in spots, and they would have yielded more except for the mature forest that largely covered the land. Darrow described the condition in terms of deer populations:

"When Henry Hudson sailed his Half Moon up the river which now bears his name, deer were most numerous in the fertile lowlands of the State, such as the valleys of the Hudson, Mohawk, Delaware, Susquehanna, and Allegheny, and in the Erie-Ontario-St. Lawrence



The fox squirrel now provides hunting in lake states woodlots where formerly an unbroken forest supported abundant gray squirrels.

The cottontail and bobwhite are other species that needed openings and brush stages of vegetation. They now are found over a much larger range than in primitive times.



Plain. Elsewhere in the extensive stands of 'big timber' they were less plentiful." (4).

This was a common condition in forested parts of the country. A taxidermist in northern Minnesota recorded his observations in the Ponsford region. He remarked that deer spread northward in the State with the advance of civilization (and forest cutting). "In fact, our big thick timber with its lack of underbrush to serve as food supply and protection, would not have been a congenial habitat for the deer." (7).

As this amateur observer knew, an all-age forest is most favorable to deer (as to most other game), and these animals frequently build up rapidly in brushy cut-overs and burns. Because such conditions are widespread, we probably have more deer in North America today than the continent ever supported before arrival of the Nina, Pinta, and Santa Maria.

It is evident that the historical overhauling of wildlife habitat brought about a corresponding revision of the fauna. One of the few animals that had inhabited uniform stands of deep woodland was the gray squirrel. When woods gave way to fields, this animal disappeared. But fox squirrels had lived on the prairie edges and these spread eastward occupying the farm wood lots (a similar "edge" situation) of a large, new range.

In the same way, the gray fox was replaced in many areas by the red fox. The raven retreated with the forest and the crow moved in. The cottontail, woodchuck, badger, striped ground squirrel, and prairie deer mouse invaded new range as it was prepared for them. Of course, such wilderness animals as the elk, bear, beaver, panther, wolf, bobcat, and turkey could not last. They faded with their habitat.

Sometimes we lose sight of the fact that the new environment was productive also. It came to support the species fitted for using it. Now prominent among such adapted species is the pheasant, which was introduced from Asia. It is found almost exclusively on agricultural lands, and no other game animal is more closely associated with fertile soils and the raising of grain—corn, wheat, rice, sorghum, or soybeans.

The new wildlife communities that developed were complete with herbivore components. They reached the kind of self-adjusting and fluctuating "balance" of species that is evident everywhere in animal populations. This was neces-

sarily so, because a wildlife community cannot exist in any other condition.

So forest wildlife was replaced by "farm wildlife." A vast management program that no one planned brought it about. Results of our recent efforts to study, plan, and improve habitats for the benefit of useful mammals and birds are difficult to see because they are on a small scale and our techniques for "seeing" are crude. Also, sometimes in our ignorance we are trying to cure something that isn't wrong!

Nevertheless, a look at the record is reassuring, in that it certifies the effectiveness of *real* habitat improvement and *the importance of building up and maintaining land fertility*. The prime necessity now is to recognize the usefulness of wildlife and give it consideration as a byproduct of farming. As one point of departure, we can well afford to allow brushy cover to grow in "odd corners" where it is not in the way of agricultural operations. That is the easiest and most practical kind of wildlife management.

We are developing other techniques of improving "edge" conditions on the farm by means of such devices as hedges, windbreaks, living fences, and field borders. In some land types these can help break up the solid pattern of open fields, and work thus far indicates that they can have "practical" uses in the farmer's business of making a living.

We have only begun to work with such things. It would be a departure from human experience if we did not make mistakes and follow blind alleys at times. But there is no doubt that the approach is correct—if we can find the means to work on it.

LITERATURE CITED

- (1) ANONYMOUS
1914. FRANK FORESTER FORESAW GAME DESTRUCTION. A forecast written 60 years ago, worth reading today. *Forest and Stream* 82:83-84, 90.
- (2) BENNITT, RUDOLF
1939. SOME AGRICULTURAL CHARACTERISTICS OF THE MISSOURI PRAIRIE CHICKEN RANGE. 4th N. Amer. Wildl. Conf. Trans. 491-500 pp.
- (3) CRAWFORD, BILL T.
1950. SOME SPECIFIC RELATIONSHIPS BETWEEN SOILS AND WILDLIFE. *Jour. Wildl. Mgt.* 14:115-123.
- (4) DARROW, R. W.
1948. THE WHITETAIL IN NEW YORK. Part II. *State Conser.* 2(3):10-13.

- (5) LEOPOLD, A. S. AND PAUL D. DALKE.
1943. THE 1942 STATUS OF WILD TURKEYS IN MISSOURI. Jour. Fores. 41:428-435.
- (6) MERSHON, W. B.
1923. RECOLLECTIONS OF MY FIFTY YEARS HUNTING AND FISHING. The Stratford Co., Boston 1-259 pp.
- (7) OXTRA, A. T.
1930. PLANT AND ANIMAL LIFE. (In "Ponsfordian," compiled by Benno Watrin.) Press of the Park Rapids Enterprise (Minn.) 1-55 pp.
- (8) PARKMAN, FRANCIS
1894. THE JESUITS IN NORTH AMERICA IN THE SEVENTEENTH CENTURY. Little, Brown, & Co. lxxxix-463.

DISTRICT PROFILE

HON.
CHARLES J. WARNER
of
NEBRASKA

An inscription over the portals of the Nebraska State Capitol at Lincoln reads: "Honor the pioneers who broke the sod that men who come might live."

Charles J. Warner, 77-year-old Lieutenant Governor, who has a farm 4 miles northeast of Lincoln and is a member of the Lancaster County Soil Conservation District board of supervisors, would like to add another: "Honor



Lt. Gov. Charles J. Warner in his office at home. He is a member of the board of supervisors of the Lancaster Soil Conservation District, and has a soil and water conservation plan fully applied on his land.



Always a supporter of the University of Nebraska College of Agriculture, the State experiment station, and the extension service, the Lieutenant Governor also has given much encouragement to the education of youth. Here he inspects a grass waterway near Waverly on the 4-H Club conservation project of Melvin Peterson (left) and Edwin Peterson (right). Club Leader Paul Nordstrom is second from left.

the men who saved their soil that men who follow might live."

"We have to save the soil we still have, and build up its fertility as much as we can," Warner says. "We have to do this to stay in business as well as to provide a place where future generations can earn a living."

It is with considerable pride that he realizes, as he plans soon to turn active management of his farm over to his two sons, that the land is in better condition and more productive than when he got it—that it is the beneficiary of a complete soil and water conservation plan.

Although he is modest about it, Warner has been responsible not only for the conservation plan on his own farm, but also has had much to do with making it possible for all the farmers and ranchers in Nebraska to get similar advantages. He was speaker of the unicameral legislature when the State Soil Conservation Districts Act was brought up.

"You might say that the bill didn't have a friend when it was introduced," Warner explains. "The idea was new. After they read the bill, a good many senators found things in it that they didn't like. Well, the bill was rewritten and passed. Most of the senators didn't think it would amount to much anyway. But it did. Soil conservation districts cover all parts of the State now, and I believe everyone likes them."

He soft-pedals his part in pulling the act out of the fire, but his associates say that his was the guiding hand in the revision of the proposed measure so that it would be enacted. He started cooperation with the Lancaster County Soil Conservation District immediately after it was organized in 1941—the twenty-sixth in the State—and got the aid of SCS technicians in developing his own plan.

Nebraska became a State only 7 years before Warner was born a few miles from his present home. He has been actively identified with the State's progress for a long time. He was elected representative to the legislature at 24, after graduation from the University of Nebraska Agricultural College.

He served 6 years in the legislature when Nebraska had both a House of Representatives and a Senate. He was out of the legislature for 14 years, then returned for an 18-year stint as State senator in the two-house legislature. He was speaker of the first unicameral legislature. Now he is nearing the end of his second term as Lieutenant Governor.

Throughout the years, he continued to farm and assembled the unit he still actively manages with the aid of his sons. He also has been a bulwark of support to the agricultural college and experiment station. At 40 he married. His elder son, Charles, has been associated with him for several years. Another son, Jerome, graduated from the University of Nebraska this year and has joined the farming enterprise.

Warner's farm totals, 1,540 acres. Five hundred bottom-land acres along Salt Creek are used for permanent pasture. Because of its susceptibility to frequent flooding, this land is not suited for cultivation. The rest of the farm is upland, terraced and farmed on the contour. Waterways are all well established. From 300 to 500 acres of the upland are in grass and legumes at all times as part of the crop rotation, feeding livestock and improving soil structure at the same time.

Wheat is the only crop that is marketed. The corn, other grain, and grass go to feed livestock. His herd of registered Herefords is widely known and few of the 145 calves produced each year go to the livestock markets. Nearly all are sold to other farmers for replacements and herd improvement.

"Why did I start on the conservation plan?"

Warner repeated the question. "Really, for two reasons. I could see ditches developing on those slopes. Furthermore, I've always made it a practice to try what the fellows in the Department of Agriculture and at the agricultural college suggest. I've always figured that those men are studying ways to help improve farming, and when they make a suggestion it's worth a trial. Most of the time, the things they suggest work out, too."

He explained that the slopes on the upland part of the farm are long, and with rows up and down hill the runoff water got a good head. That, he said, meant the loss of a lot of soil. Previously, it had seemed that replanting some of the crops was necessary almost every year because of wash-outs. No replanting has been needed since the conservation plan was put on the land.

More water is conserved than most people realize, he observes. As an example of the amount of moisture that is in the soil now, he told of the small side draws on the farm that have springs flowing. There used to be springs in those draws, he said, but they dried up and remained dry for 40 years until this year.

A great change has come over Lancaster County during Warner's lifetime. He remembers that there were few gullies when he was a young man. The land had not been farmed long enough after breaking the sod for erosion to show up much. Besides, much land now cultivated was then still in grass. As the years passed, more and more gullies appeared and the topsoil began to get thin. He told of a number of farms that had declined a great deal in productivity.

"I recall particularly the rather recent experience of one friend of mine," Warner said. "His farm had come from his grandfather to his father and then to him. He lives in town and rents out the farm. It is a place that supported two generations prosperously.

"One day this friend complained that he had a poor renter, and the farm was returning barely enough to pay taxes. I went along with him and an SCS technician to look the place over. He found that it wasn't the renter's fault at all. The topsoil was gone from the fields. They were down to the glacial clay.

"He was told that the land needed terraces and waterways, but that the terraces wouldn't

be enough in themselves. Instead, the land would have to be put into alfalfa and brome-grass for a few years, then cropped a couple of years, and put back into brome-grass and alfalfa again. Such a rotation, together with fertilizer, will be needed for a long time.

"The income from the farm had declined as the topsoil disappeared. Former generations took the cream and the present generation got the skim milk."

More than one farm in Lancaster County is like that, he continued, but added that generally speaking the situation would not be too bad if all of the landowners and operators were to get busy on soil and water conservation. Many are already well along on their conservation plans but others are still dragging their feet. That the land can be saved and made more productive for both present and future generations is their leader's firm conviction.

"There's no question but that conservation of the soil, good crop rotations, and the use of fertilizer will increase the productivity of our farms," he concluded. "I know that we are now losing little, if any, soil, in spite of hard rains. I know that our soil is getting more mellow and that our crop yields are up by over 25 percent. I've been told by others that they have had the same experience. But you must start with conserving the soil, for if the soil washes away the fertility goes too."

That is the reason Lieutenant Governor Charles J. Warner would add another inscription on the State Capitol at Lincoln in honor of both those farsighted early-day farmers who conserved topsoil and the thousands who are now gradually overcoming the effects of uncontrolled erosion: "Honor the men who save the soil so that men who follow may live."

—A. E. MCCLYMONDS

REPORT ON SEVENTH ANNUAL SESSIONS OF SOCIETY

By A. M. HEDGE

THE seventh annual meeting of the Soil Conservation Society of America was generally acknowledged to be the best yet held.

The papers were interesting, and the speakers effective. Outstanding was the emphasis placed by most speakers on the objectives of soil conservation in terms of better living conditions for farm families, rural communities, and urban areas. At the opening session President Morris Fonda set the stage for such a theme. He was immediately followed by J. S. Russell, farm editor of the *Des Moines Register and Tribune*, who drew on his experience as a farm editor, as well as on the opportunities he has had to observe world conditions under the auspices of the United Nations.

The Thursday afternoon session, presided over by Dr. Robert M. Salter, Chief of the Soil

Conservation Service, brought out some excellent papers on technical matters. Dr. M. B. Russell, head of the agronomy department of the University of Illinois, gave a thoughtful and informative address on new developments in cropping practices. The discussion of physical improvement in soil through the use of soil additives to improve structure, by Dr. R. W. Pearson, senior soil scientist, Bureau of Plant Industry, located at the Alabama Agricultural Experiment Station, brought out some differences of opinion as to the practicability and usefulness of these new chemicals. It was generally agreed that much additional research will be needed to bring the cost of such materials within the realm of practicability for general use in agriculture. Dr. Emil Truog, professor of soil fertility, University of Wisconsin, did his usual fine job of laying low certain widely accepted misconceptions about soil-fertility improvement. He liberally illustrated his talk with examples of potential improvements that can

Note.—The author is chief of project plans division, Soil Conservation Service, Washington, D. C.

be made with proper attention to the needs of the soil.

Friday morning Phil H. Noland, vice president of the Minneapolis-Moline Co., talked about conservation and the work of the farm-equipment industry, as related to their dealers and the soil conservation districts. Clifford E. Cairns, director of the livestock service division of Wilson and Co. at Albert Lea, Minn., offered many helpful ideas for making full use of grasses in livestock production. Durward Allen, assistant chief, branch of wildlife research, Fish and Wildlife Service, Washington, D. C., received well-deserved acclaim for his practical and common-sense suggestions regarding wildlife and the business of farming. At the end of his talk, the society passed a resolution stating that Dr. Allen had presented the best paper on wildlife and farming they had ever heard. Sherman E. Johnson, assistant chief, Bureau of Agricultural Economics, Washington, effectively summarized the farm-management problems involved in soil conservation and suggested that additional attention ought to be given to this phase of conservation planning.

What proved to be the highlight of the entire meeting for many of the delegates was a panel discussion, "Getting Conservation on the Land," by representatives of the Allegany County (N.Y.) Soil Conservation District. Included in the panel was the man who had been county agent in Allegany County when the organization of the district was first initiated, as well as a vo-ag teacher who took a prominent part in that activity. Also participating were a farmer representing PMA, the cashier of the First National Bank of Whitesville (who is also a district supervisor and farmer), the chairman of the Allegany County Soil Conservation District, and the district conservationist. The panel was led by Hugh M. Wilson, extension soil conservationist at Cornell University, who had himself played an important role in organizing the district.

This panel brought out in chronological order the educational steps that were taken which led up to the organization of the district, and then traced the 10-year development of the district. Here there are now about 1,600 co-operators, and their accomplishments are even more impressive when it is recognized that Allegany County is one of hilly terrain and low

fertility. It was revealed that before the district began operation there were many abandoned farms, and others that were tax delinquent. At present abandoned farms and tax delinquency have virtually disappeared. Land values have increased, as has production per acre. It was made clear that such results were achieved only through the enthusiastic and co-operative efforts of all agencies and groups in the county that were in a position to work together on the total conservation job, including education, technical assistance, and financial assistance. Harold Bloss, the banker, stated that the bankers of the county did not turn down any reasonable application for a loan for conservation purposes. Lynn L. Watson, representing PMA in the county, indicated that payments available to farmers had been consistently directed toward helping people carry out the conservation practices planned in connection with the district program.

Hugh Chamberlain, district chairman, pointed out that in the Allegany area there were no private equipment contractors operating, although the terrain requires a considerable amount of earth-moving to install a satisfactory conservation program. Thus, the lack of equipment became a chief difficulty. To solve this problem, the district over the years gradually has acquired heavy earth-moving equipment worth more than \$100,000. This district is currently in debt only \$1,400, which is budgeted to be paid off this year. The panel set forth the fact that new business derived from conservation operations amounts to approximately \$500,000 per year to people of the county who are dealing with farmers.

These results have become apparent in terms of better buildings, more and better livestock, and a more general prosperity in the county.

The banquet on Friday evening had the benefit of a barber-shop quartet to put the crowd in a merry mood for what followed. The main address by Dr. Raymond Miller, consultant, FAO of United Nations, dealt with international aspects of land use.

A new feature was added to the program Saturday morning when the chairmen of the various technical committees under the leadership of E. H. Graham, assistant chief of the Soil Conservation Service, presented brief resumés of the work of the committees and outlined

future courses of action. The interest displayed in reports by delegates indicated that this is an activity which the society can afford to broaden and strengthen in future years.

Rt. Rev. Msgr. L. G. Ligutti, executive director of the National Catholic Rural Life Conference, delivered an inspiring address intended to emphasize the importance of conservationists recognizing the end product of their work in terms of its effect on family living, community life, and problems of State, national, and international human relations.

Miss Florence Reynolds, representing Food and Agriculture, United Nations, followed with an interesting talk on the work of her organization and its relation to soil conservation. She drew on the statements of previous speakers to show the effect of conservation on people and

the concrete work of FAO. She also made a strong plea for active participation in FAO by scientists and technicians who are equipped to help people of other countries to help themselves on food production and the stabilization of their agricultural economies.

Many of the delegates brought their wives to the convention and the local arrangements committee provided tours for them each afternoon. Next year's meeting—the eighth—will be held at Colorado Springs. Advanced preparations already are being made, and a record number of participants is expected.

YOUNGSTERS COMPETE.—Thirty \$300 college scholarships are offered to boys and girls as awards for top-rating achievement records in four National 4-H programs being conducted by 47 States this year.

The programs, number of scholarship awards in each, and donors are: Field Crops and Frozen Foods, 6 each, International Harvester; Poultry, 10, Dearborn Motors; and Soil and Water Conservation, 8, Firestone.

State winners in Field Crops and Poultry each will receive an all-expense trip to the National 4-H Club Congress in Chicago next November. Each State champion in Frozen Foods and Soil and Water Conservation will be presented a 17-jewel wrist watch; 8 sectional winners in the former program and 16 in the latter will be given a trip to the Chicago Club Congress. County winners will get medals.

OFFICERS ELECTED

H. H. Bennett, president
R. Y. Bailey, first vice president
P. H. Noland, second vice president
J. S. Russell, treasurer
H. Wayne Pritchard, secretary

Council Members

Roy D. Hockensmith
Fred A. Wirt

Best Articles of the Year in

Journal of Soil and Water Conservation

First, Soil, the Substance of Things Hoped For
Firman E. Bear
Second, Soil Management, Soil Sense, and Soil Conservation
C. L. W. Swanson
Third, Planning the Watershed
Carl B. Brown

Fellows Elected

Walter Gumbel
Fred A. Wirt
Fred J. Sykes
Edward N. Munns
Alvin C. Watson
Arthur B. Beaumont
Edward H. Graham
Austin L. Patrick
Arthur C. McIntyre
John Lamb, Jr.

Honorary Members Elected

Waters S. Davis
Walter R. Humphrey
Walter R. O'Neal
A. G. Brown
J. E. Noll

GUIDE FOR YOUNG AND OLD

(Continued from Page 122)

he probably doesn't know. He might even become a Scoutmaster some day.

This manual will no doubt help the coming generation to become aware of the danger of our dwindling land resources. The manual points out that everyone, young and old alike, has a stake in our land resources; and that each of us has a responsibility in the preservation of these resources. The booklet is profusely illustrated with snappy photographs on all phases of soil and water conservation.

It is unfortunate that all of us older people did not have such a guide, with proper leadership, a quarter or half a century ago. No doubt our conservation problems would have been more nearly solved.

The manual was written by Bernard Roth, Soil Conservation Service, Upper Darby, Pa., with the help of Bert D. Robinson, National Merit Badge Counselor in Soil and Water Conservation, of the SCS, in Washington. The booklet may be obtained from Boy Scouts of America, 2 Park Avenue, New York. The price is 25 cents per copy.

YOUNG FARMERS' DAY

By PHOEBE O'N. HARRISON

A FIELD day with a wholly new inspirational appeal was put on in the Charles County Soil Conservation District in southern Maryland last October 8. It was a young people's affair from first to last. Nobody over 30 was allowed on the planning or working teams. The minimum age limit was 14. Speed and precision were the order of the day, which was a brisk day of softly clouded sunlight against the richly

(Continued on page 134)

THE PICTURES

1. Eight acres were prepared for new pasture: disked, limed, fertilized, seeded with mixture of orchard grass, Ladino clover, alsike clover, red clover.
2. Farm buildings were renovated. This is work on tobacco barn.
3. Lime was spread on renovated old pastures, at rate of 500 pounds per acre.
4. Adult committee: W. R. Tascher, extension soil conservationist, Washington, D. C.; A. L. Jones, Sears Roebuck Foundation, sponsor; Walter Bender, general chairman; Charles Ellington, extension soil conservationist, University of Maryland.
5. Youth committee: girls—Mrs. Howard Cooksey, Mrs. William Albrittain, Mrs. Harold Hancock, Shirley Porter, general secretary; Mrs. John Sullivan. Boys—Howard Cooksey, Kenneth Berry, Walter Bowling, Jr., William Boggs, Walter Bender, general chairman; William Hardesty, Carl Baldus, John Thompson, James Rollins.
6. Robert Radcliff operates State Road Commission bulldozer clearing brush in preparation for seeding new pasture.
7. A 400-yard tobacco bed was prepared with cyanamid and methyl bromide.
8. A 4-strand barbed wire fence was built around a pasture.
9. The young workers lined up for their lunch boxes, which were readied by the Methodist Church Guild of Charlotte Hall.





(Continued from page 132)

colored October woods all around the scene. And, of course there was dust, that pale tobacco land dust that is the very essence of the country where the fine cigarette weed grows.

At this field day there were no speeches. There wasn't even much talking. Except for the busy roar of the many great machines it was the quietest conservation field day recorded up to this time. There was only work, and speed, and a peculiar intentness on getting a soil conservation plan laid out, right on the farm where it belonged. There were flying young figures and slick machinery all over the place, but there still was that impression of quiet and a difficult job that could better be done without fuss or horseplay.

The Young Farmers' Conservation Day was announced for 10 o'clock, and it did begin at 10. Every worker was in place. All machines were in place, manned by slim young chaps who loved those machines and handled them with the unaffected nonchalance of skilled Arabian horsemen atop their beloved steeds. Almost instantly the great tractors and small tractors with their powerfully efficient attachments were in action. Lime spreaders were piling on the white dust, and weary old fields, tobaccoed almost to death, were being made over at the hands of youth. There was a lot of pasture making at this Young Farmers' Conservation Day!

It all began some time ago, when young adults in various parts of the country began asking what *they* could do for soil and water conservation. They wanted something they could do on their own, without baldhead supervision. There were all kinds of programs for children, for established older farmers, and even for industrial and civic groups who put on tremendous shows with thousands looking on; but young adults just getting started or still in the learning stage were being left out.

The Sears Foundation people heard about the young farmers who wondered what *they* could do, and a plan was cooked up. The Sears people realized early that this was a project worth sponsoring and encouraging. Three counties, one in Colorado, one in Nebraska, and one in Maryland were selected as test counties—to learn what young farmers *wanted* to do and *could* do. In the old tobacco county of southern

Maryland we saw the third and last of these tests on that colorful October day.

A. L. Jones, representative of the Sears Foundation, was there as an unobtrusive observer, and he seemed as pleased as Punch to learn that this particular group of young farmers knew what they wanted to do and could do it—and that, to them, helping soil and water conservation meant getting out on the land and throwing all their weight into a complete conservation plan in 8 hours of October daylight.

The young farmers not only did all the work at this field day, but they planned it themselves and promoted it. They met time after time, to decide what they wanted to make of their own field day. They appointed their committees, with Walter Bender, just getting started at farming and happy and forceful about it, as a kind of superchairman of them all. They had their own publicity and public-relations committees, a budget committee and a recreation committee, as well as those essential committees whose special duty it was to arrange the work to be done on the farm land and in the farm home.

They enlisted the assistance and advice of the county agent, P. D. Brown, and the SCS men working in the district. W. Mitchell Digges, district conservationist, ended up by being chairman of the General Advisory Group; and Anna Wills, home-demonstration agent, worked with fervor to help the young wives and sisters with the home remodeling and decorating job.

Out of some 50 farms, the group chose a young farmer's 100 acres for their field day. It was the farm of Mr. and Mrs. Howard Cooksey and their two little children. It was eroded and worn and production was low, but the Cookseys were trying mightily to make a go of it. That, however, was not the primary reason that it was finally selected. The conservation plan for the farm showed that only drastic changes in land use and farming practices would revive that land, tobaccoed since colonial days and suffering from gullying and sheet erosion, as well as that "soil anemia," so common and heartbreaking in many parts of our Atlantic Coast States. The young farmers saw in Cooksey's farm plan a chance to demonstrate many practices, to get the feel of those practices combined into one soil and water conservation system, and to show that youth could

do this thing on the land as well as older and more experienced people.

Machines fairly flying, they took 8 acres of that old tobacco land and made a new pasture. Soil tests showed need for 2 tons of lime and 500 pounds of 5-10-10 fertilizer per acre; and that is what went into that new pasture, along with 8 pounds of orchardgrass seed, 1 pound of Ladino clovers, 2 pounds of alsike clover, and 2 pounds of red clover. The pasture needed a fence, and a four-strand barbed wire was quickly built by modern conservation "magic" and a powerful post-hole digger.

They renovated an old ailing pasture with lime and 5-10-10, 8 pounds tall fescue, 1 pound of Ladino and 2 pounds of red clover to the acre. And they top-dressed another pasture which Howard Cooksey had established in 1952, using 1½ tons of ground burned lime and 500 pounds of 0-14-14 fertilizer to the acre. You could almost see the tired old soil picking up, taking on new life, as the top dressing went on in clouds of white dust obscuring the autumn foliage.

There was a tremendous gully at the far end of the farm, calling for an 800-foot diversion and outlet, a bulldozer, and a seed mixture composed of blue grass, red top, White Dutch clover, rye grass and a ton of lime and 300 pounds of 5-10-10. Half a dozen busy young conservation enthusiasts performed this operation almost without onlookers, as it was far away and difficult of access. But they were ridding the world of one great gnawing gully, and that was that.

Six acres retained for tobacco by the Cookseys was planted to a cover crop, on the contour. Wheat was used for this, and 300 pounds of 3-12-6 fertilizer. At the same time, half of the 400-yard tobacco bed was treated with cyanamid, and the other half with methyl bromide. This being a hand job, it took some hours to prepare the soil, lay the tubing, and cover properly for effectiveness.

While watching this operation and trying to learn the why and how of preparing a tobacco bed, a rake turned up at my feet a large and heavy fossil. It is a Miocene Pectinacea whose opening mechanism never worked, so that it died smothered by sediment and was gradually fossilized as a solid piece throughout the ages! At any rate, it was deposited there on that

tobacco farm eons before the early white settlers were told that they would be "banished men" if they did not ship cargoes to the value of two thousand British pounds sterling to England their first year. I wanted that fossil. I asked if I might have it. I was told that it belonged to no one. It now rests peacefully on a shelf between a whale's tooth and a chunk of coral from Trinidad—in another Maryland county.

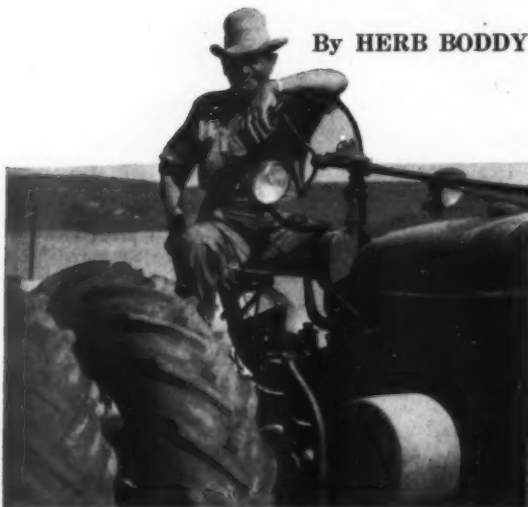
While the field operations were in progress, some other more tedious jobs were tackled and completed with the peculiar dash of youth in action when they know what to do and how to do it. In the house, the girls were painting the kitchen, arranging new cabinets for Mrs. Cooksey's convenience and better living, and the homestead roof was getting its first coat of paint. Landscapers were planting a large Japanese chestnut tree for shade for the children's summer play, with privets and other shrubs and even an iris border. And, for a time, some 4-H Club girls were busy with two demonstrations—frozen food and ironing.

A big tobacco barn, filled with the great brown leaves drying, was for a time the center of interest. Old rotted-siding was pulled off and replaced with new boards, and paint brushes were flying on the roof of the shed. A new door was made on the spot and hung in place. And, during the brief lunch hour, the lunch boxes packed and donated by ladies of the Methodist Church were distributed, chuck-wagon style, from the floor of the big truck backed up against this tobacco barn. During this period, when yellow-capped workers came hurtling from every direction, the music provided by the Charlotte Hall Military Academy Band floated across the fields to the big bulldozer at work on the farm road.

This band music, and the dance at the Episcopal Hall that night from 9 to 12 midnight, for the young workers only, was the only "recreation" connected with this Young Farmers' Conservation Day. They put a conservation farm plan on a farm, and that was what they set out to do. The significant thing is that this group of young people demonstrated, without any doubt, that in their opinion they can best contribute to soil and water conservation by getting out on the land and doing the job that needs to be done to improve the land itself.

COLUMBIA BASIN RESPONDS TO IRRIGATION

By HERB BODDY



Tom Clark last summer seeded an irrigated pasture on very light textured soil. He talks and practices good land use.

GOOD land use is very much in the minds of today's young crop of Columbia Basin settlers.

Already, many newcomers to the Basin are taking a keen interest in their soil conservation district, and are shaping their new farm enterprises from the ground up. They regard it as easier and less costly to take good care of their lands now, than to pay the fiddler later on. For as they farm, so goes the harvest in Washington's new farming empire.

Most settlers are keeping a close eye on their agricultural stake. You won't catch them using piecemeal methods, nor running their place by rule of thumb. If they can't do with assurance a soil or water conservation job, they get a helping hand from the supervisors of their soil conservation district.

There are ample indications that the doctrine of good land use is well ingrained in the hearts

of the farmers of Moses Lake, Quincy, and Ephrata. They are thoroughly committed to such measures as crop rotations, selected pasture mixtures, cover crops, and well laid out irrigation systems. Here in a million-acre, mesa-like area are hundreds of modern farming enterprises in the making.

The cool waters of the Columbia River are the key to the rising fortunes of the settlers. Last summer some 250 farms, covering around 23,000 acres, were raising irrigated crops in the Basin's eight farmer-voted soil conservation districts. And each year it is expected that 750 new farms will receive water for the first time.

Most of the settlers are young war veterans with a yearning for the land. Few are experienced in farming. A good many are recent graduates of State agricultural colleges. But the Basin's young farmers are doing well on their 80-acre homesteads. Their farms are neat and tidy. With the objectives clear, and the instrumentalities at hand, farms are beginning to operate like well-oiled machines. But settlers know they have a long way to go. Putting into production the tinder-dry, sage-covered lands of the Basin counties is not easy. Settlers must know the kind of crops to plant, the soils they are working with, how to care for the land the conservation way, and what to do about irrigation water. They also must learn, sooner or later, what to do with the "dusters."

Many of the problems encountered can be worked out individually. But when tougher problems occur, there is need for the specialized and scientific help available through soil conservation districts.

Members of district governing boards serve without pay and are farmers or ranchers themselves. They have taken the job of furnishing settlers with the right kind of technical help from the Basin staff of the Soil Conservation Service and other agencies. The districts serving farmers are: Quincy, Ephrata, Moses Lake, Othello, Wilson Creek, West Franklin, Moses

Note.—The author is in the current information division, Soil Conservation Service, Portland, Oreg.

Coulee, and Hartline-Highland. All of these are ready to help bridge the gaps in good land-use programs.

In the great, saucer-like area which forms Washington's central plain, there hasn't been much change, other than the coming of Columbia River water, since early Inland Empire farmers moved in their oxen-drawn moldboard plows and started raising dry-land grain and cattle. Winds blow at a good clip. Dusters still ruffle dispositions. It is as heart-rending as ever to try to farm without water.

Of course, not all of the old summer-fallow farmers lived in a "grapes of wrath" setting. There were many lean years. There were also many fat ones. But gains from the new irrigated crops figure to out-strip greatly the best profits

chalked up under dry-land methods.

In the Basin today, dairying and livestock predominate. Settlers like the advantages of irrigated grassland. Water, they know, is the best safeguard against droughts. Land dry as a chip will yet produce bountiful yields of vegetables, grass seed, dairy, and livestock products. What a tossed salad Basin homemakers can make out of the vegetables they grow! But shrewd marketers, who have kept close tab on the Basin boom, say it won't be vegetables, but soil-building hay and pasture crops that will bring prosperity.

Once permanent pastures are established, you don't have to give them the seasonal care required by row crops. Owners of top pastures like August Drittenboss, of the Ephrata district and



Percy Driggs (left) tells Cecil McCormac of this enthusiasm for the lush forage in his new pasture.



The 510 steers grazed on the irrigated pasture of Karl and Doc Goodrich's Moses Lake farm gained an average of 2 pounds per day last summer.

Much land calls for cuts and fills to provide even flow of water. Here technicians check a leveling job in the Moses Lake area.



Mel Stepon sets irrigation spiles to deliver the right amount of water to furrows on new land near Quincy.

Percy Driggs, Karl and Doc Goodrich, Bob Goodwin, and Morgan's Dairy of the Moses Lake district, are justly proud of their lush pastures.

The chance to build a paying pasture is much better now than formerly. New foundation grass and legume seed, produced in nurseries of the Soil Conservation Service and State experiment station, are making forage feeds higher in yield and more healthful for cattle. There is less risk and more gain from using modern fertilizers, 'too. Higher quality pasture forage results in increased butterfat and meatier cattle. And rotated grazing fields permit cropped areas to rest and come back.

What do settlers like best about grassland farming, aside from yields? Those who own improved pastures contend that it is the sprinklers, the border system, and the improved furrow system. When properly laid out, an irrigation system steps up production, saves time and labor, cuts soil losses. You can set it and forget it.

Ten years ago irrigated pastures were few and far between in Franklin, Grant, Adams, and Douglas Counties. This year the Ephrata headquarters of SCS reports that it has helped with the leveling of some 75 to 100 farms, and on them conservation irrigation systems were laid out. Several of them are watering pastures.

irri-
Doc
ined
last

In Grant County, recipient of the first outpouring of Columbia water, the number of farms has jumped from 500 to nearly a thousand in less than 2 years.

Percy Driggs, diversified farmer and head of the board of the Moses Lake Soil Conservation District—oldest in the Basin—puts the settlers case this way:

“One of our big good land-use jobs today is to help settlers put a good part of their farm lands in soil-building hay and pasture crops. It's important that we farmers set up good

crop-rotation programs and pick the right pasture mixtures. The right kind of crop rotation boosts soil fertility and farm incomes.

“As a rule settlers obtain better results by getting into a rotation at the outset. They will save on their nitrogen bill because much of it is grown during the 5- to 9-year rotation span.”

Driggs, along with the chairmen of other Columbia Basin soil conservation districts (Melvin Stepon, August Drittenboss, A. O. Hampton, and Ray Bailie) hopes to see nearly half of the newly irrigated Basin land in conservation-type pastures by 1956.

BUSINESSMEN-FARMERS.—Toney Ernestes, work unit conservationist in Forsyth County, N. C., thinks other work unit men might be surprised, as he was, if they made a list of the business and professional men in their work units who have district farm plans.

Ernestes checked the records in his work unit and found that the following have district plans: 10 doctors, 4 automobile dealers, 4 ministers, 4 real-estate dealers, 4 tobacco-company directors, 3 contractors, 3 attorneys, 3 printing-company owners, 3 brokers, 3 wholesale grocers, 2 chain-grocery owners, 2 electric executives, 2 paint-store owners, 2 radio-station owners, 2 bank directors, 2 tobacco-warehouse owners, 2 judges, 2 laundry owners, 2 gasoline distributors, 2 wholesale beer distributors, 2 county commissioners, 2 bakery owners, 2 wholesale feed owners, 2 wholesale seed owners, and 1 beauty-salon owner, sheriff, school superintendent, tobacco-company president, restaurant owner, rock-quarry owner, mining engineer, chamber of commerce president, awning manufacturer, Cuban consulate, headache-powder manufacturer, bank president, wholesale florist, hosiery manufacturer, knitting-mill owner, ex-Secretary of Army, college president, battery manufacturer, and newspaper owner.

DYKES' HOBBY REFLECTED IN PRINT.—After a hard day's work, there's nothing so bolstering as an absorbing hobby—and SCS folks are like others in that respect. A good example is the deputy chief of the Service, J. C. Dykes, who is becoming widely known for his collecting of books of western Americana. A bibliophile of no mean stature, his Ranger and dime-novel collections are among the best in the country. His home is adorned with fine Western originals, etchings and prints, in keeping with his interest in the old days of open range, cattle wars, and other marks of frontier life.

From the press of the University of New Mexico recently came Dykes' liberally annotated book, “Billy the Kid, The Bibliography of the Legend,” which the University's editors hold “probably could have been written by no one else.” This book is regarded as a very valuable addition to the literature of the southwestern phase of the great American tradition.



Conservationist Caskey and Engineer Baldwin work out scheme for cuts and fills. Parts of 75 to 100 farms were smoothed out in the Basin last year.

HIGHWAY USERS, FARMERS, AND TAXPAYERS BENEFIT

By A. E. McClymonds

MOST counties are still maintaining bridges over streams and gullies, where they cross the roads. But not Washington County, Nebr. There the county commissioners are replacing bridges with drop-inlet structures as fast as they can.

"The beauty about those drop inlets," says Clarence Kuhr, "is that once one is in, our troubles with that piece of road are over." Kuhr is county commissioner in charge of road maintenance at Blair, Nebr.

At present the county commissioners are spending \$75,000 to \$100,000 a year on drop inlets. More than 75 major structures have been built already. In addition, small concrete structures have been placed at the heads of culverts where signs of trouble have appeared.

To explain: A drop inlet consists of a riser—an upright pipe or hollow concrete structure—built to the necessary height in a gully at the upstream side of a planned earthen dam, and a nearly level tube of a length necessary to carry the water under the earth fill. The fill is built later on. The earth fill, or dam, and the riser permit filling of the gully on the upper side; the water is let down through the riser and out the other side, through the tube, in safety. The



Looking from drop inlet up grass waterway on farm of Chris Christensen, August 1952. No road maintenance has been needed here since completion of structure.

Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.

fill becomes the roadbed and concrete wings are built at the top of the riser to protect the fill from wave erosion.

Progress in the development of drop-inlet structures is the result of close cooperation between the county commissioners, the Papio Soil Conservation District, and the Soil Conservation Service. The commissioners' enthusiasm for them springs from the performance of those that were built in the middle thirties, when soil and water conservation began with the use of a CCC camp and WPA labor. The SCS, supplying the technical services, designed these drops.

Bridge maintenance has always been a man-sized headache in Washington County. Much of the county is steeply rolling and its soil erodes easily. Some of the stream courses and gullies are gashes as deep as 50 feet.

Depth alone does not, however, cause the trouble. The gullies tend to grow wider and to branch at the sides. Bridge approaches are destroyed. Some of the side gullies menace roads leading to the bridges. In at least one instance, a stretch of road had to be shifted to one side to get away from a side gully—and now the side gully is again menacing it.

"The regular procedure has been, first, to lengthen a bridge after the approaches are undermined, and then usually we have had to replace the whole structure the next time work has been needed," Kuhr comments. "It wasn't long before we were faced with the job of building major bridges, and they really cost money."

At the moment, he was standing on an 80-foot bridge that had to be replaced. A drop-inlet structure will be substituted. With him were Soren Jensen of Blair and Bruce Cox of Fort Calhoun, county commissioners; Hjalmer Quist of Blair, chairman of the district supervisors; Simon Korsoj of Blair, road contractor; Roy T. Kirkpatrick, area conservationist; and C. Edmund Anderson, work unit conservationist. The other county commissioners—Albert Sprich and Aaron Hansen of Blair, Mark Cameron of Herman, and Fred Stork of Arlington—were not along.



Where a watershed is not protected, the gully on the upstream side of a drop inlet fills rapidly. Top view was taken in June 1952, just after structure had been completed but before old bridge had been removed and the earth fill built. Lower view was made in August.



Eighty feet was no longer a sufficient span over this creek. The distance to the creek bed from the bridge floor was 34 feet. Jensen remembers the stream as it once was.

"I used to drive over this creek frequently when I was courting Mrs. Jensen years ago," he reminisces. "Only a little bridge was necessary then. But look at it now. Every year, something had to be done. Finally the bridge had to be replaced. This is the fourth bridge to be built here."

When the first drop inlets were installed in 1934 and 1936, as parts of conservation plans, they were primarily for the benefit of the farmers. Each had a huge gully eating its way through his farm. A structure was needed to control it, and the logical place was at the road at the lower edge of the farm.

It took a bit of persuading to get permission to build the first drop inlet at the right place, but permission was granted and the county

cooperated by taking out the bridge and making the earth fill that became the new roadway. Quite a number were built in those early days, when the farmer furnished only the materials and the CCC boys and WPA workers did the work.

After the cessation of the CCC camps and WPA, the construction of drop inlets came to a virtual standstill. The structures that were needed were too expensive for the average farmer, even with the PMA aid that was available.

The county commissioners began to take note of what had happened to the roads where the first drop inlets had been built. About 8 years ago they decided to substitute drop inlets for bridges everywhere except over drainage canals and major streams.

"Those drop inlets proved to be permanent improvements," Kuhr says. "We have not had to spend a dime on them in the 17 or 18 years since they were built, except for routine smoothing of the road surface that you have to do anyway."

The commissioners turned to the soil conservation district, and the board of supervisors—Quist, Clarence King, Pierce Allen, Harry Wrick, and A. H. Sibbersen—agreed to make available the aid of SCS technicians assigned to the district. The supervisors had a dual interest—the benefit to the farmers, and also to the taxpayers.

"At first it took quite a bit of time to lay out the projects and inspect the work," says Anderson, "but now it takes very little. The commissioners have had a lot of experience with the structures during the years. Korsoj has had the county contract for the last few years and is thoroughly familiar with this kind of construction."

"About all we need to do now is to figure the watershed area above a proposed drop inlet, determine the size of tube needed, and set the bench mark that designates the height of the riser. Knowing the size of the watershed, we get the information about the size of drop inlet from tables."

Setting the bench mark is extremely important. This is because no drop inlet should interfere with the functioning of one that is upstream from it—and there often are several road crossings on a stream.

He pointed to one example where the bench mark was set at 20 feet above the stream bottom. There was room for a 22-foot riser, but at that height it would be higher than the bottom of the tube in the structure upstream.

The commissioners of necessity have to operate solely on the basis of needs for the protection of the county roads. Thus, they determine priority without consideration of benefits to individual farmers, or whether conservation has been applied to the watershed. In fact, they like to build for an unprotected watershed, figuring that the application of conservation to the land affords an added safety factor. Every one of the county commissioners is a real booster for conservation farming.

Of course, heavy silting occurs from land that is not conservation farmed. It first fills the gully space on the upstream side of the drop inlet. After that, the flowing water carries silt, as it did before, but it is no longer able to do any gully cutting above the structure.

Farmers are benefiting materially. The experiences of Chris Christensen, near Kennard, and Albert Orht, near Blair, are typical. The drop inlet at the Christensen place was built in 1934, and the one at the Orht place a year later.

"You bet that drop inlet helped me," Christensen said. "There was a big gully eating up that draw. It would have gone clear to the top of the hill. It had already taken about 8 acres out of production.

"Well, in a few years the gully filled with silt to the top of the riser. Now I've got the whole field terraced and contour-farmed, and there's a nice grassed waterway where the gully was. There's been no more gully washing."

Water reached the top of the road only once after the drop inlet was built, but it did no damage, he says. That was when a terrifically heavy rain fell before he had the land terraced. Conservation farming, with terraces and contour tillage, grassed waterways, and grass in the crop rotation, Christensen adds, has reduced the flow of water a great deal.

Orht's experience is similar, except that he has his grassed waterway at another place and grows crops where the gully was.

"There's no more tearing up of the land by the water as it goes over the formerly gullied

place," he says. "The drop inlet keeps it from cutting, yet it drains off rapidly enough not to hurt the crops. I farm right through the place where the gully was.

"The fellow on the land below mine has put a structure where our stream empties into the main creek. Now the water from both farms flows over a gentle grade and cannot cut down into the land any more."

Generally, constructing a drop inlet costs considerably less than replacement of a bridge. On the spot, at the 80-foot bridge scheduled for replacement in the autumn of 1952, Korsoj figured the cost of the structure at \$12,000. The county commissioners estimated \$4,000 or \$5,000 for the fill. This makes a total of \$16,000. Their experience has been that putting in a new bridge of the required size would run in excess of \$20,000. Experience also has shown that it would not be permanent.

How much effect has this program had on country road expenditures? Kuhr puts it this way:

"We are spending as much money as before, because we are building drop inlets as fast as we can, and still have some 300 bridges that must be maintained until we can replace them with drop inlets.

"But every time we build a drop inlet, it's a permanent improvement and the road will thereafter be safe. That means no more expensive repair and replacement costs.

"By comparison, a bridge has to be given a new deck every 3 to 5 years. It costs an average of nearly \$10 to buy and lay each bridge plank. Every year, bridge approaches have to be repaired. And after a time, the whole structure has to be replaced."

It is to be noted that the county has not had to buy a bridge in the last 6 years. Each time a new bridge has been needed, one has been available from a section where a drop inlet had been built. The 80-foot bridge will be moved to a site that has already been chosen.

"We still have a long way to go," Kuhr concludes, "and we can't go ahead as fast as our farmers desire. But we are on the move. When we get through, road and bridge maintenance costs are bound to drop to a small fraction of what they are now. Remember, we've had no maintenance costs on drop inlets built thus far."

Cooperation of county commissioners, soil conservation district, and the Soil Conservation Service is moving ahead in the interests of economy, safety for the users of the roads, and conservation of the county's soil and water resources.

REVIEWS

FORESTRY AND ITS CAREER OPPORTUNITIES. By Hardy L. Shirley, 492 pp. 1952. New York, N. Y.: McGraw-Hill Book Co., Inc. \$6.50.

There have been numerous books on the general subject of forestry and its scope and also various leaflets and articles on forestry as a lifetime job. From a rich background of forestry research and teaching, Dr. Shirley has written a book that combines the two subjects. One purpose was "to present a broad picture of forestry" both historically and as related to national and world economy. But primarily the book was written "to help beginning students to understand the many facets of forestry." This general treatment of forestry provides the background to aid the student readers "in deciding if forestry is to be their life career."

The first half of the book covers forestry and forest products, ranging from historical facts through distribution of forests, their protection, management, and on to the primary and secondary products of the forests. Although these chapters condense the subject, they are full of interesting details. The reader, for example, gains a good understanding of the paper industry and recent developments in wood chemistry. Appreciation of the varied fields of forestry is built up without special emphasis on any one activity.

Careers in each major field and the various opportunities for employment in these fields are given attention in the latter half of the book. The qualifications, rewards, and hazards are fairly sketched for the student reader. The realistic presentation of all factors to be met in the commercial operation of a forest property marks chapter 15 as one of the most outstanding in the book.

A wide range of material, including the De-

partment of Agriculture Year Books and studies of Society of American Forestry committees, was drawn on for reference. Statistical tables are few, with considerable data of this type in the text. The 23 pages of index provide full coverage for reference. Illustrations are well selected.

It is hard to avoid some duplication or extra writing in attempting to cover as broad a subject as this and to touch all interests in forestry. Not all chapters would be of interest to the general reader and the student may find some that are beyond his needs.

The book will be a valuable contribution in vocational guidance. It also offers to the general reader a fund of forestry and products information that is nontechnical, interestingly written, and up to date.

—C. B. MANIFOLD

AUXILIARY HOSTESSES AT CONVENTION.—Members of the Women's Auxiliary of Soil Conservation Districts in Nebraska are looking forward to being hostesses at the NASCD Convention in Omaha, February 3-5. They are planning a "get-acquainted tea" and other functions so that the women from all States may know each other.

The women of the Nebraska Auxiliary are keenly interested in soil conservation and are happy for the opportunity to hear the outstanding speakers the men will have on their program. As Omaha is a central location for the National meeting, they hope for a large attendance with representatives from every State.

COOPERATION PAYS.—A \$17,000 community drainage-ditch program at Sunderland, Mass., is yielding many public benefits and helping 54 farmers with excess water problems on 639 acres. Officials and citizens of Sunderland are so well pleased with results that they are planning two additional jobs. These will help more townspeople and benefit 1,200 wet acres on 52 more farms.

Under the original program, with the town and farmers cooperating through the Franklin County Soil Conservation District, sharing the cost on a 50-50 basis, a series of old drainage ditches is being cleared and rebuilt. Through this operation farmers have turned wet and unproductive land into fertile cropland that can be worked with ease. The public has benefited through more effective protection of private property by control of runoff water from town roads. Also, home owners along the roads no longer have wet cellars. This job involves about 30,000 feet of ditching. The two new projects now being organized will produce 31,000 feet of ditches.

CONSERVATION STOOD WATCH.—James H. Whitaker, of Marshall County, Ala., thinks the best way to get an appreciation of conservation farming is to come back to the farm after an absence of 2 years.



Whitaker examining volunteer button clover in corn middles, September 1952. The clover, planted in 1949, reseeded each year during his absence.

Whitaker, after a tour of duty in World War II, bought a farm and worked out a conservation program in 1948 with help of SCS technicians in the Northeast Alabama Soil Conservation District. Included in the plan were sericea, alfalfa, tall fescue, and white clover for pasture and hay; reseeding crimson clover and button clover for cover crops on Class II cultivated land; and waterways of fescue and sericea.

Whitaker was called back to the Navy in 1950 and didn't see the farm again until he was released in June 1952. The sericea needed only fertilizing and mowing. The tall fescue and white clover were going into the summer in good shape. Crimson clover was setting a good seed crop on an excellent volunteer stand, and the button clover looked so good that he turned it and planted late corn. The alfalfa was about gone, the only failure on the place.

Whitaker went to a cattle sale and came back with enough cattle to stock the pastures that were ready to provide excellent grazing. Thirty days after his return he was back in business, thanks to the sound conservation program he had put on the land.

NOBEL PRIZE TO WAKSMAN.—It is with vicarious pride that *SOIL CONSERVATION Magazine* takes notice of the award of the 1952 Nobel Prize in physiology and medicine to a distinguished former contributor to these pages, Dr. Selman A. Waksman, microbiologist, New Jersey Agricultural Experiment Station.

Way back in January 1938 this magazine published Waksman's excellent and well-illustrated article, "The Living Soil." Again, in April of that year, appeared another outstanding feature, "Humus and Soil Conserva-

tion." Already the Rutgers University scientist was on his way to national and international recognition, and his writings were evidencing his explorative abilities as well as his unusual talent for clear and interesting writing.

The Nobel Prize, specifically, was for Dr. Waksman's discovery of the "wonder drug" streptomycin, used in combating tuberculosis. It is the fourteenth time that the prize has come to an American, and the first time that it has gone to a teacher at an American agricultural college. With Dr. Hans Adolph Krebs, British scientist, he shares the money attached to the honor, the two dividing the sum of \$32,910.51 between them.

LAURELS FOR PARKS.—The Fairfax (Va.) Rod and Gun Club, flushed with pride in its new man-created lake on its 358-acre tract in Prince William County, at dedication ceremonies paid tribute to Harry R. Parks, SCS work unit conservationist. Receiving him as an honorary member—only the second in the club's history—the organization cited Parks "for his distinguished service, technical assistance, sound advice, and complete cooperation, rendered in connection with the planning and construction of its lake."

The club plans a comprehensive program for members and their families, with rifle ranges, skeet field, archery facilities, camping grounds, and numerous other attractions. The lake has been stocked for fishing, and wildlife will be plentiful. Woodland, waters, and fields will be under expert management.

HOLDING WATER WITH FIBERGLASS.—Dale Balch had a big spring on his farm, 5 miles northwest of Dayton, Wash., from which he was getting little use except for household purposes. He investigated the possibility of building a pond for livestock water and supplemental irrigation on a small pasture. The site was found to be underlain with open gravel—very poor pond material.

After Balch had given up the idea of building a pond, Bill Meiners, SCS technician, suggested the possibility of using fiberglass material to seal the reservoir area. Balch decided to go ahead with the pond after some encouragement from a fiberglass company as to costs, methods of installation, and availability of material.

A 120,000-gallon pond, 210 feet in circumference and 11 feet deep, was constructed. Seven hours of D-6 dozer time were required; and the 396 square yards of fiberglass material, which cost \$392.47 f. o. b. Dayton, were put into place in 2½ days by two men.

Dale's 3-acre irrigated pasture, seeded to orchard-grass, Alta fescue, and Ladino clover, will now carry his eight head of purebred Shorthorn cows. Running stock in this fashion had never been heard of in this area, and Dale believes that annual cropping, seeding the highly erodible areas to grass and legumes, and irrigated pastures may change farming methods in Columbia County.